

a pedestal in the reaction chamber adapted to secure the substrate during the deposition, the pedestal being movable between an upper position and a lower position;

a first chamber section above the pedestal in the upper position;

a second chamber section along side or below the first chamber section,

wherein volume of the reaction chamber may be varied by moving the pedestal between the upper position, where the first chamber section together with the pedestal in the first position define a first chamber volume, and the lower position, where the first and second chamber sections together with the pedestal in the lower position define a second, larger chamber volume.

[c18]

19.The apparatus of claim 11 further including a perforated plate above the pedestal in the first chamber section, the perforated plate being adapted to diffuse the precursors.

[c19]

20.The apparatus of claim 11 further including an environmental control for maintaining the first chamber section at a different temperature than the second chamber section.

## Abstract of Disclosure

[0038] A method of depositing material on a substrate comprises providing a reactor with a reaction chamber having a first volume, and contacting a surface of a substrate in the reaction chamber with a first precursor at the first chamber volume to react with and deposit a first layer on the substrate. The method further includes enlarging the reaction chamber to a second, larger volume and removing undeposited first precursor and any excess reaction product to end reaction of the first precursor with the substrate.